

ZERO ANAPHORA IN MANDARIN CHINESE

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I. Introduction

Zero anaphora (ZA hereafter) is found, to some degree, in all languages. Gundel (1980:142) claims that "the more topic prominent a language, the less restricted its use of NP-anaphora." In Mandarin, a topic-prominent language, ZA is particularly evident. Li and Thompson (1979:327) (L&T hereafter) maintain that ZA rather than pronominal anaphora is the norm in Mandarin discourse. In this paper, I will examine L&T's (1979, 1981) remarks on ZA in Mandarin and discuss the "elusive" nature of optional ZA in discourse. Drawing from recent pragmatic studies, I will propose an Optimal Output Principle (OOP) as an improvement of L&T's analyses.

II. L&T's Conjoinability Hypothesis and Conditions on ZA

Through a textual study of two Chinese classic novels and with the statistical results showing considerable disagreement among Mandarin speakers on the occurrence of ZA, L&T (1979:312) maintain that the interpretation of referent for ZA must depend on pragmatic knowledge. In order to account for the occurrence of ZA and pronoun insertion, they propose a conjoinability hypothesis:

- (1) The degree of preference for the occurrence of a pronoun in a clause inversely corresponds to the degree of its conjoinability with the preceding clause. (1979:330)

The conjoinability is explained as the speaker's and hearer's shared conception of certain discourse unit as one grammatical unit rather than two separate, independent units. L&T hold that conjoinability is impaired 1) when the clauses contain a switch from background information to foreground information, 2) when the second clause is marked with adverbial expressions, 3) when the two clauses constitute different turns in conversation.

In another study L&T (1981:658-659) note that "a salient feature of Mandarin grammar is the fact that noun phrases that are understood from context do not need to be specified." They further specify three conditions where pronouns are omitted, which can be briefly summarized as:

- (2)
 - i. an NP is understood from what has already been said.
 - ii. a referent is understood when it is general or non-specific.

- iii. an NP is in a topic chain, where a referent is referred to in the first clause, and then follow several more clauses talking about the same referent but not overtly mentioning that referent." (1981:659)

Along with these conditions they also propose two syntactic constraints: ZA cannot occur when 1) the NP comes immediate after a co-verb; 2) it is the pivotal NP in a serial verb construction. (1981:675)

L&T's studies are significant in that they reveal the pragmatic nature of optional ZA in Mandarin, and the conditions and constraints make the occurrence of ZA in discourse predictable. However, there are still some problems and difficulties with their analyses. First, the conjoinability is problematic in that the notion "inversely correspond" has a proportional and hierarchical implication. However, the degree of conjoinability, which is supposed to work in that manner, is not defined in the same way. Moreover, there are other difficulties with this hypothesis. Second, although the three conditions generally captures the phenomenon, there are some details which the conditions fail to predict and explain.

The conjoinability is worked out from a perceptive point of view. However, whether the speaker's prediction of the hearer's sentence perception process is based on the conjoinability hypothesis is questionable. In order to test the validity of the conjoinability hypothesis and some aspects of topic chain, a survey was conducted among 20 native Mandarin speakers through a paragraph (presented as example 1) from Lu Ding Ji "Deer and Tripod Tales" (Jin, 1981), a modern Chinese novel. In the survey, the native speakers were asked to point out the referents of ZA in the paragraph. (ZA throughout the analysis are presented with \emptyset with subscripts as the indices of the referents. The antecedent NPs are underlined.) In the following example, the results with the percentages indicating the proportion of the subjects in favor of the choice of the referents show that L&T's hypothesis is not adequate to explain the phenomenon:

1) [1] tā₁ shuō zhe zǒu dào chuāng biān, [2] \emptyset_4 100% xiàng
 3sg say DUR walk to window side to

chuāng wài wàng qù, [3] \emptyset_4 100% zhǐ jiàn tiān sè
 window out look go only see sky color

yīnchénchén de, [4] \emptyset_3 100% sì yào xià xuě. [5] \emptyset_4 100%
 gloomy seem want drop snow

hū jiàn nánbiān dà dào shàng liǎng gè rén, [6] \emptyset_2 100%
 sudden see south big way on two CL person

(see next page)

dài zhe dǒulǐ, [7] ϕ_2 100% bǐng jiān ěrlái, [8] ϕ_2 95%
wear DUR hat by shoulder come

zǒu dào jìn chù, [9] ϕ_1 100% rèn chǔ miànmào.
walk to near place recognize out face

"While talking he walked to the window, and (he) looked out of the window. (He) saw that the sky was gloomy. (It) seemed to snow. Suddenly, (he) saw two people wearing bamboo hats from the big road on the south. (They) came shoulder by shoulder, and (when they) came closer, (he) recognized (their) faces."
(Jin, 1981:7)

In this case, under the conjoinability hypothesis, the speaker and the hearer will share the conception that the whole discourse unit is composed of two conceivable grammatical units, i.e., clauses 1, 2, 3, 4, and 5 as one unit, and clauses 6, 7, 8, and 9 as another. The latter is separated from the former by the NP liǎng gè rén in 5. However, the percentages in the example indicate that the native speakers did not interpret the last clause as one grammatical unit with the preceding clause, because the ZA in the subject position refers back across two clauses to tā. In this case, the use of ZA in the last clause cannot be attributed to the writer's and reader's shared conception of the structures as one grammatical unit. Since tā is already established as the protagonist, the faces have to be those of the strangers, and the ZA, therefore, refers to tā. In this respect, the speaker's and hearer's pragmatic knowledge separates the whole discourse unit into two conceivable units, i.e., one (composed of 1, 2, 3, 5, and 9) carries out the main story line, while the other (composed of 6, 7, and 8) carries some background information. This suggests that the occurrence and interpretation of ZA in certain discourse units are determined by the discourse context rather than by the shared conception of certain structures.

L&T's (1981) three conditions on ZA, from another angle, offer a more satisfactory explanation in that the discourse context is the primary concern. However, because they are largely based on a distinction between given and new information, there are some weaknesses with these conditions. Some other factors should be considered to refine them. First, the first condition that an NP is understood from what has been said seems to confine the condition to verbal contexts. Extra-linguistic contexts are left out. In Mandarin, one of the prominent features is that when a referent is visibly clear, it will be realized as ZA unless being emphasized.

Second, in the topic chain proposal, i.e., the third condition, "same referent" is not clearly defined. The problem is that if the referent is plural or collective, then "same referent" may refer only to the whole, or may refer to individuals of the whole. Consider the following example:

- 2) Qiánmiàn sān liàng qiú chē zhōng fēnbíe
front three CL prison van in separate

jiānjīn de shì sān gè nánzi, Ø, dōu zuò shūshēng dǎbàn,
jail NOM be three CL male all be scholar look

yī gè, shì bái fà lǎo zhě, liǎng gè, shì zhōngnián rén.
one CL be white hair old man two CL be middle-aged man

"In the three prison vans in the front were jailed three men.
(They) all looked like scholars. One was a white-haired
old man, the other two were middle-aged men." (Jin, 1981:7)

In this example, the first NP, sān gè rén "three men" and the following NPs share the same referent. Thus, they are in a topic chain. However, only the second, which refers to the whole, is ZA. The last two, which specify the individuals of the whole, are overt NPs. This case reveals the effect of a part vs. whole relationship in ZA in Mandarin, i.e., if the triggering NP is plural, the following NPs in the topic chain can be ZA only if they are not partitive.

Moreover, the definition of topic chain implies that once a topic chain is established the ZA must have the same referent as that of the first clause. However, this is not the case. The occurrence of ZA in example 1 is a case in point. In example 1, the topic chains are interrupted not by overt NPs but by ZA. The ZA occurring in clause 4 cannot possibly refer to tā "he," and also as discussed earlier, the person who stood by the window and recognized the faces cannot possibly be the two strangers who are in the topic chain. L&T (1981:661) treat this kind of problem as an exception and offer no explanation.

The main problem with L&T's account of ZA is that they fail to consider the details in the relationship between the speaker's and hearer's pragmatic knowledge and the discourse situations. The crucial point is that the pragmatic situations are one of the determinants of the occurrence of ZA in discourse. In the following sections, I will approach these problems in the light of Prince's (1981) Assumed Familiarity Hierarchy, and show that the relationship between the speaker's and hearer's pragmatic knowledge and the different pragmatic situations is an important factor governing the occurrence of ZA in discourse.

III. Optimal Output Principle

Prince (1981:233-237), notices the weakness of the binary distinction of given-new information in the traditional pragmatic analysis, and proposes the Assumed Familiarity Hierarchy, in which the NPs are classified into entities according to the different pragmatic factors of the NPs involved in certain discourse units.

It can be summarized as follows:

(3) New: the hearer has to create a new entity (brand new) or has to retrieve an unused file in his/her memory (unused) to understand the message, e.g., I bought a book today.

Evoked: the entity in the discourse is already in the hearer's register and is evoked either by discourse situation (situationally evoked), e.g., Could you open the door? or by linguistic context (textually evoked), e.g., I bought a book. It's very interesting.

Inferable: the entity which is understood by logic or semantic association, e.g., I couldn't drive my car today. The radiator is broken.

As mentioned previously, the relationship between the speaker's and hearer's pragmatic knowledge and pragmatic situations is the crucial factor governing the occurrence of ZA in Mandarin. In the following analysis, the emphasis is, therefore, on the evoked entities. The parameters adopted are: situationally evoked, textually evoked, inferable, and new. As Mandarin is noticeably a pragmatic/topic prominent language and the native speaker's comprehension of certain structures depends mainly upon pragmatic and semantic knowledge, a communicative principle can be proposed to account for ZA phenomenon in Mandarin:

(4) Syntactically/pragmatically conditioned variation favors optimal semantic/pragmatic output (output here means the surface form of the utterance), i.e., an overt NP will occur whenever there is a risk of confusion or loss of necessary information in communication.

This is a universal communicative principle. Kiparsky (1982:68) finds a similar principle at work on the phonological level where the optimal output governs the application of optional phonological rules. Owing to its pragmatic nature, Mandarin structure is specially constrained by this principle. It predicts that the occurrence of optional ZA is blocked when:

- a. the referent is new and cannot either be recovered by the hearer's world knowledge or be clarified by the visual situation.
- b. the referent is given but the NP referring to it adds further new information, as in the case of part vs. whole relation, or the referent carries necessary attributive information, as that in relative clauses.
- c. a topic chain is interrupted by another topic.
- d. the referent plays a role in certain speech acts, as in the case of highlighting.
- e. the referent is so far from its antecedent that its

degree of topic continuity is low.

Apart from these constraints, based on this principle, the occurrence of ZA in Mandarin generally works along the following pragmatic hierarchy (> means more likely to be ZA):

(5) Situational > Inferable > Textual > New

That is, situationally evoked NPs and inferable NPs are the most likely to be realized as ZA in discourse in that the speaker assumes that the hearer can infer them either from the discourse situation or from the hearer's encyclopedia knowledge. Textually evoked NPs, on the other hand, are less likely to be ZA, because they depend on textual factors, in which the speaker will assume that the hearer does not have any pre-knowledge about the things being talked about, if they have not already been part of a topic chain, or when the same referent is too far to recover.

L&T's (1981) conditions and syntactic constraints imply that the occurrence of ZA is mainly pragmatic, and the two syntactic constraints are the only syntactic concern in ZA. Here, I would like to point out that the occurrence of ZA also correlates with the grammatical roles assumed by the NPs involved. The subject, which usually correlates with the topic in a sentence, is expected to be realized as ZA. Givón (1984:139, 168, 171) maintains that it is a universal tendency that in discourse the subject is the primary topic while the DO, the secondary topic, is more topical than the IO. It is proposed that the occurrence of ZA in Mandarin, as far as the grammatical relations are concerned, works along the following grammatical hierarchy:

(6) Subject > Direct Object > Indirect/Oblique Object

This grammatical hierarchy, along with the pragmatic hierarchy, generally governs the occurrence of ZA in discourse, i.e., if an NP is higher (left) on the scale of the pragmatic hierarchy and lower (right) on the syntactic hierarchy, it is more likely to be ZA than an NP which is lower (right) on the pragmatic scale and higher (left) on the syntactic scale. This framework reveals the interrelationship among different pragmatic factors and discourse contexts. It maps the occurrence of ZA onto different contexts at different levels.

IV. Statistical Evidence

In order to test the validity of these two hierarchies predicting the optional ZA phenomenon in Mandarin discourse, three samples were randomly selected from three styles of speech: a piece of recorded natural conversation (approximately 450 words), an extract (11 paragraphs, approximately 865 words) from a chapter of Lu Ding Ji "Deer and Tripod Tales" (Jin, 1981), and an extract

(two sections, approximately 600 words) from an academic paper Lun Jufa Jiegou "On Syntactic Structures" (Zhu, 1962). The results are shown in Table 1 and Table 2, in which the pragmatic factors are horizontally arranged, and labeled as new (brand new and unused), sit (situationally evoked), tex (textually evoked), inf (inferable), and the grammatical relations are vertically arranged, and labeled as sub (subject, DO (direct object), IO (indirect object), and Obl.O (oblique object). The results presented in Table 1 show the actual occurrence of NPs and ZA in each joint category. Table 2 put this data into a proportional frame, i.e., the percentages of each joint category indicating the correlation between these two factors. The occurrence of overt NPs for new entities and IO/Obl.O are obligatory since no ZA occurs in these categories. The results of the optional categories reveal that the rate of ZA in sit/sub category is the highest, while that of tex/DO is the lowest, which conform to the hierarchies proposed above.

Table 1

	sit		inf		tex		new	
	NP	ZA	NP	ZA	NP	ZA	NP	ZA
sub	42	36	14	10	205	74	19	0
DO	5	3	2	1	29	1	55	0
IO/Obl.O	6	0	0	0	29	0	30	0

NP: total Nps in each joint category

ZA: zero NP-anaphora in each joint category

Table 2

%	sit	inf	tex	new
sub	85.7	71	36	0
DO	60	50	3	0
IO/Obl.O	0	0	0	0

V. Linguistic Analysis

In this section, I will discuss the factors proposed in the OOP hierarchies in different discourse contexts and situations through some examples from the three samples, and show the improvement of L&T's conditions on ZA by the OOP. The NPs under analysis are labeled according to their grammatical roles, and also according to the classification of Assumed Familiarity.

V.I. Oral Discourse

Here, I will mainly discuss the occurrence of ZA in non-verbal contexts, in which the discourse situations are an important concern. Therefore, the discussion will be centered around the situationally evoked factors. An examination of the recorded conversation shows that 35 out of 37 ZA (95%) are situationally evoked. The rest (5%) are textually evoked. The following is an extract from the conversation examined:

3) Situation: a mother and her five-year old child are about to enter the house. There is a mattress lying beside the door. The child runs to the mattress and shouts to his mother:

	sub/sit		sub/sit		DO/sit	
C1:	ø ₁	kàn,	wu ₂	dǎ:	ø ₃ ,	māmā.
		look	I	hit		Mom

"Look, I will hit (the mattress), Mom."

	sub/sit		DO/sit		sub/sit	
M1:	ø ₂	bié dǎ	ø ₃ ,	ø ₃	zāng.	
		NEG hit			dirty	

"Don't hit (it). (It's) dirty."

(The child hits the mattress, and his coat get dirty.)

	sub/sit		sub/sit		Obl.O/sit	
M2:	ø ₂	kàn	ø ₂	bǎ	yífú ₄	nòng zāng le ba!
		look		BA	coat ₄	make dirty CRS EX

	sub/sit		IO/sit		DO/new		hit		hit		sit/DO
	ø ₁	gěi	nǐ ₂	shuāzǐ ₅	dǎ	dǎ	ø ₆				
		give	you	brush	hit	hit					

"Look. (You've) made your coat dirty. I'll give you a brush to beat off the (dirt)."

In this example, the occurrence of ZA refereing to "mattress" in C1, which does not have any antecedent in the conversation, clearly does not fall under any of L&T's (1981) ZA conditions. Following L&T's account, ZA should not occur in this position. In this case, the sentence would mean the child beats his mother, because, by default, the NP māmā "Mom" would occupy the DO

position. However, the discourse situation would not allow such an interpretation, because the mattress is present in the discourse situation, and the child, in the course of this utterance, clearly shows an action towards the mattress. The pronunciation and the phrasing of the utterance also provide the clue. The slightly lengthened vowel in dǎ: "hit" and the short pause between dǎ: and māmā suggest that the direct object of dǎ: is ZA. This is a case where the discourse situation plays a decisive role. The new referent is clarified by the visual situation. Therefore, the otherwise new information is situationally given. A similar case is "dirt," which was not mentioned earlier. This ZA may either be treated as situationally evoked, i.e., the child may have noticed the dirt on his coat, or as inferable, i.e., the mother's previous words provide the clue so that the child's semantic association of dirt : dirty is initiated.

In this example, we also notice that the ZA all occur in the subject and DO positions. The overt NPs yífú "coat" and nǐ "you" in M2 are in the Obl.O and IO positions respectively. Therefore, even if they are situationally evoked, ZA is not possible. Conversely, the overt NP shuāzi "brush" is in DO position. However, because it carries new information (unused), it cannot be ZA either. These facts conform to the OOP hierarchies.

V.II. Written Discourse

In written discourse ZA is restricted by the written texts and depends on the writer's presupposition of the reader's knowledge on the subject. In the examination of the paragraphs of the narrative, out of a total of 59 ZA, 53 (90%) are textually evoked. 3 (5%) are situationally evoked, and are always found in quoted conversations. Another 3 (5%) are inferable. Examination of two sections of the academic paper also shows that out of 24 ZA, 17 (71%) are textually evoked, and 7 (29%) are inferable. In this section, I will focus my discussion mainly on topic chain and some other textual factors. Consider again example 1, repeated here as example 4 for convenience:

sub/tex		sub/tex
4) [1] <u>tā</u> ₁ shuō zhe zǒu dào chuāng biān, [2] <u>ø</u> ₁ xiàng		
3sg say DUR walk to window side		to

	sub/tex	
chuāng wài wàng qù, [3] <u>ø</u> ₁ zhǐ jiàn tiān sè		
window out look go		only see sky color

	sub/inf	
yīnchénchén de, [4] <u>ø</u> ₃ sì yào xià xuě.		
gloomy		seem want drop snow

(see next page)

- [5] ^{sub/tex} \emptyset_1 hū jiàn nánbiān dà dào shàng ^{DO/new} liang gè
sudden see south big way on two CL
- rén₂, [6] ^{sub/tex} \emptyset_2 dài zhe dǒulì, [7] ^{sub/tex} \emptyset_2 bīng jiān
person wear DUR hat by shoulder
- ěrlái, [8] ^{sub/tex} \emptyset_2 zǒu dào jìn chù, [9] ^{sub/inf} \emptyset_1 rèn
come walk to near place recognize
- chū miànào.
out face

In this example, we see that there are two topic chains triggered by NP tā "he" and liang gè rén "two persons" respectively. Based on L&T's (1981) definition of topic chain that ZA is supposed to have the same referent with the first clause, the subjects in clauses 4 and 9 should not be realized as ZA, because they do not share the same referent with the first clause in each topic chain respectively. Under the OOP hierarchies the occurrence of ZA in these places can be explained. The ZA in 4, which interrupts the first topic chain, is treated as inferable. In the survey, the native speakers interpreted the referent of this ZA as "sky" or "weather." This suggests that the writer assumes that the reader's semantic association of sky:snow will automatically be initiated. Second, the ZA in the last clause is not in the second topic chain. This, as noted before, is due to the shift from background information to foreground information. Since the reader's understanding of the referent does not depend on the immediate written context, but on the logical reasoning, in this analysis, it is treated as inferable.

Another case which L&T do not mention is one in which two topic chains intertwine, which is a typical case of what Givón (1981:9) has termed chain initial topic, i.e., the topics in the discourse unit are alternately newly introduced, newly changed or newly returned topics; with regard to the preceding context they are discontinuous topics; yet, they are persistent topics concerning the succeeding context. The following example is an illustration, which will show further constraints on the topic chain:

- 5) [1] Zuìhòu yī liàng qiú chē zhōng shì gè shào
last one CL prison van in be CL young
- fù₁, [2] \emptyset_1 huái zhōng bào zhe gè nǚ yīng₂.
woman breast in hold DUR CL female baby

(see next page)

[3] Nǚ yīng dīkū bù xiū. [4] Tā mǔqīn wēn yán
 female baby₂ cry NEG stop 3sg mother soft word

xiāngkè, 5 Nǚ yīng zhǐshì dà kū.
 persuade female baby₂ only big cry

"In the last prison van was a young woman. (She) had a baby girl in her arm. The baby girl kept crying. Her mother consoled (her) softly. The baby girl still cried loudly."
 (Jin, 1981:7)

In this case we see that the topic chain established by the first NP shào fù "young woman" in the first clause is very short, i.e., it only continues to one other NP, i.e., the subject NP of the second clause. The following NPs are not ZA even if they have already been said and carry given information. The only possible variation is for the subject in clause 3, i.e., nǚ yīng "baby girl" to be realized as ZA, because it is immediately next to "baby girl" in clause 2. Also, the word dīkū "cry" in Mandarin only refers to the cry of a baby. Other variations are not possible. If the subject in clause 4, i.e., tā mǔqīn "her mother" were realized as ZA, the paragraph would be unacceptable. Because of the topic chain effect, the ZA would be perceived as referring to the "baby girl." This reading would go against logic: how can a baby girl cry and at the same time console herself? If the subject of the last clause, i.e., nǚ yīng "baby girl" were realized as ZA, it would not be acceptable either, because, owing to the effect of the topic chain, the ZA would be interpreted as referring to the "young woman." This would again be against the reader's pragmatic knowledge. A person cannot possibly console himself/herself softly while crying loudly.

This case shows that in the use of ZA, pragmatic factors are primary in Mandarin discourse. The possible variations are constrained by the speaker's and hearer's semantic/pragmatic knowledge and discourse situations.

At first glance, it may seem that example 1 is a counter-example to this topic chain analysis. However, the cases are different. Example 1 involves two types of topic chains, i.e., one with foreground information and the other with background information. In example 5, the two topics are equally foregrounded. Hence, it may be that an intervening topic chain has a blocking effect on the occurrence of ZA in the topic chain it interrupts if it is equally foregrounded.

As observed above that ZA is more restricted in written discourse, an examination of a formal written discourse will reveal some other factors and constraints predicted by the OOP. Consider example 6, a paragraph from academic writing:

- 6) ^{new/sub} Yǔyán gòuzào, jiǎn shì yǒu céngcì de, yīncǐ
 language structure since be have level NOM thus
- ^{inf/sub} zài ^{new/DO} fēnxī yī gè yǔyán piànduàn ^{inf/sub} shí, ^{inf/sub} shí
 at analyze one CL language fragment² time
- chùle bā ^{tex/Obl.0} tā² ^{new/Obl.0} fēngē chéng jīběn dānwèi³, bìngqiě zài
 besides BA ^{3eg} cut into basic unit and at
- ^{tex/Obl.0} zhèxiē dānwèi³, de ^{new/Obl.0} páiliè shùnxù⁴ zhīwài, ^{inf/sub} hái dě
 these unit ASSOC row order⁴ outside also should
- ^{tex/DO} fēnxī zhègè yǔyán piànduàn², de ^{new/DO} céngcì gòuzào².
 analyze this language fragment ASSOC level structure

"Since language structures have levels, when (one) analyzes a language unit, (one) not only breaks it into basic units and points out the order of these units, but also (one) should analyze the structures of the levels in this language unit."
 (Zhu, 1962:522)

In this instance, we see that all of the ZA are inferable. The semantic association of the reader is linguistic analysis: linguists. The occurrence of ZA in this case falls under one of L&T's (1981) ZA conditions that the ZA refer to general or non-specific NPs. The NPs with the anaphoric demonstratives zhèxiē "these" and zhègè "this" in the last two clause present a problem with L&T's first condition that ZA is an NP understood from what has already been said. The demonstratives and the antecedent NPs indicate that the NPs are textually evoked, i.e., they have already been said. If they were realized as ZA as predicted by this condition, the whole paragraph would be unacceptable. The obligatory occurrence of the overt NPs, in this case, is due to the fact that they are the attributives of the head NPs, i.e., they are the necessary links of old and new information in the discourse unit. Under the OOP constraints, they are not expected to be realized as ZA.

V. Conclusion

This paper, by taking some details of pragmatic factors and grammatical relations into account, aims to improve on the details of L&T's (1981) conditions on ZA, especially on the topic chain analysis. This study reveals that the occurrence of optional ZA in Mandarin is governed by the OOP. This principle is reflected in the hierarchies and constraints proposed in this

paper. Since Mandarin is known as a typically pragmatic and topic prominent language, the grammatical relations, to a great extent, assume the pragmatic relations. The grammatical relations also, to some extent, reflect the degree of syntacticization of overt NPs in different grammatical relations. The subject is the most likely to be realized as ZA while the IO/Obl.O are the least likely. This suggests that the overt NPs in the IO/Obl.O positions are syntacticized in Mandarin, and those in the DO position are syntacticized to some degree, while whether NPs in the subject position are ZA or overt is generally determined by pragmatic factors.

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